WORK PLAN

FOR

WORK ASSIGNMENT NO. 0-182

SMOKEY MOUNTAIN SMELTER

FEBRUARY 10, 2006

WORK PLAN
SMOKEY MOUNTAIN SMELTER

Prepared for
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)/
ENVIRONMENTAL RESPONSE TEAM (ERT)

Date:	February 10, 2006
Contract No:	EP-C-04-032
Assignment No.	0-182

Approval:

REAC Task Leader Ken Wardhuff **Date:** 2/10/06

REAC Group Leader Ken Wardhuff **Date:** 2/10/06
(Cost Model Review)

REAC Program Manager [signature] **Date:** 2/9/06

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Work Assignment Number:	**0-182**
Work Assignment Title:	**Smokey Mountain Smelter**
Work Assignment Manager:	**Barbara Williams**
Lockheed Martin REAC Task Leader:	**Ken Woodruff**
Duration:	**January 11, 2006 through September 30, 2006**
Contract Number:	**EP-C-04-032**
Site ID:	**04ZZ**

INTRODUCTION

Purpose. The purpose of this Work Assignment (WA) is to assist the Environmental Protection Agency/Environmental Response Team (EPA/ERT) in (1) determining the type and extent of contamination in soil and groundwater at the Smokey Mountain Smelter Site and (2) evaluating technologies for treating on-site wastes (if required). Work will be carried out by Lockheed Martin Response Engineering and Analytical Contract (REAC) personnel in consultation with the Work Assignment Manager (WAM).

Background. The Smokey Mountain Smelter Site is located on approximately 13 acres in Knox County, Tennessee, just outside the City of Knoxville. The site previously housed a fertilizer plant before being converted to a secondary aluminum smelter. After smelting operations ceased, the site was used as a mixed waste dump before it was finally abandoned. A large building, apparently now in poor condition, housed the smelting rotary and casting furnaces. The disposal area for slag and other wastes is not secure and can be accessed by local residents. Reportedly, contaminated surface drainage from the site flows into a nearby tributary which ultimately discharges to the Tennessee River.

In 1997 the Tennessee Department of Environment and Conservation (TDEC) completed an assessment of the site that indicated the presence of metals, polyaromatic hydrocarbons (PAHs), and ammonia. There are also indications that halogenated organics and low-level radioactive wastes may also be present on site. Following the preliminary assessment by the state, EPA Region IV requested that the Agency for Toxic Substances and Disease Registry (ATSDR) assess the public health risks from the site. The agency's subsequent *Health Consultation* report indicated that concentrations of contaminants in the on-site wastes did not pose a public health hazard "under current conditions". The impact to groundwater or ambient air quality was not investigated but was identified as a concern in the ATSDR report.

General Assumptions. The WAM will serve as the liaison to the general public and other agencies during the response to this WA. Collection and analysis of soil, groundwater, or air samples, installation of monitor wells, or other technical support beyond that specified in this Work Plan (WP), may increase the cost of the project, and necessitate a WA amendment.

TECHNICAL APPROACH

REAC personnel have been tasked to accomplish the following:

Task 1: Conduct Literature Search. A literature search, including aluminum smelting techniques, will be conducted to determine the contaminants likely to be encountered as a result of all historical activities.

Task 2: Site Visit. A preliminary site visit will be completed to evaluate site conditions and logistical problems likely to be encountered in future site activities, including multi-media sampling.

Task 3: Develop Sampling Plan. A cost-effective sampling plan for soil and groundwater will be developed based on the site visit (Task 2), a review of background information, and existing analytical data. The plan will help to fully delineate the extent of contamination and may include the installation of groundwater monitor wells to determine the extent of groundwater contamination. Statistical methods may be used to determine soil sampling points and well locations. The sampling plan may involve on site analysis for volatile organic compounds (VOCs) and metals using a portable gas chromatograph/mass spectrometer (GC/MS) and a portable x-ray fluorescence (XRF) unit respectively. In this case, 10 percent (%) of the samples collected would be sent to the REAC laboratory in Edison, New Jersey (NJ) for confirmation analysis. Alternatively, all samples collected during this project may be sent to an outside laboratory for analysis under the EPA Contract Laboratory Program (CLP). EPA Region IV personnel will be responsible for all arrangements for CLP lab analysis.

Task 4: Collect Soil Samples. Soil samples will be collected in accordance with the sampling plan developed in Task 3. Both surface soils and samples from continuous cores obtained with a Geoprobe™ or similar hydraulic-push technology may be collected. Upon retrieval, the continuous cores will be screened with a photo-ionization detector (PID) to select discrete sampling depths. The soil samples will then be placed in 4-ounce glass jars and submitted for analysis of VOCs, semi-volatile organic compounds (SVOCs), metals, and other analytes, such as cyanide or fluoride, as requested by the WAM. Samples will also be screened in the field for radioactivity using a portable radiation meter. Sample coordinates will be determined using Global Positioning System (GPS) technology.

Task 5: Install Monitor Wells. Groundwater monitor wells will be installed at the site as necessary, based upon a review of existing data. It is assumed for cost purposes that five overburden wells (approximately 20 feet deep) and five shallow bedrock wells will be installed. Overburden wells will be constructed of two-inch nominal diameter polyvinyl chloride (PVC) casing with either five or 10 feet of screen. The screened section will be gravel-packed with bentonite seals as necessary. Bedrock wells will preferably be constructed by first installing a surface casing through the overburden into at least 10 feet of competent bedrock, grouting the casing into place, and then completing the well with an inner screen and riser pipe, based upon fractures and groundwater encountered during drilling. Wells will be constructed in accordance with applicable State of Tennessee regulations and will be developed before sampling. The budget assumes that all wells will be installed using rotary drilling methods. However, it is presently uncertain what constitutes "shallow" and "deep" groundwater at the site. It may be possible to sample shallow groundwater using small diameter wells installed by direct-push technology during or immediately following the collection of soil samples. This latter option will be determined after the site visit and a review of local geologic conditions. Well coordinates will be determined using GPS technology and well elevations will be surveyed to a common datum.

Task 6: Conduct Water Level Measurements and Groundwater Sampling. Groundwater levels will be measured in all monitor wells and the measurements will be reduced to a common datum. Following measurement of groundwater levels, all monitor wells will be purged and sampled for VOCs, SVOCs, and metals and then submitted for analysis.

Task 7: Sample Surface Water Sources. Surface water sources such as ponds, streams, or drainage ditches identified in the initial site visit (Task 2) likely to be impacted by site contaminants will be sampled for VOCs, SVOCs, and metals analyses at the request of the WAM. Samples may be sent to the REAC Laboratory for analysis, or alternatively, to an outside laboratory under the EPA CLP through EPA Region IV personnel.

Task 8: Conduct Domestic Well Survey. A domestic well survey within one mile of the plant site will be conducted to determine possible impact to private groundwater supplies from site contaminants. Information sources may include state and local health departments, the Tennessee Department of Environment and Conservation (TDEC) , the Tennessee Division of Geology, and the U. S. Geological Survey (USGS).

Task 9: Prepare Interim Report. An interim report will be prepared on the results of the extent of contamination survey. The report will discuss the various types of waste found and suggest, appropriate, treatment or disposal measures, including pilot studies for evaluation of suggested remedial technologies.

Task 10: Submit Deliverables to ERT-IMS Website. All deliverables and other relevant project information will be submitted in electronic format to the site-specific ERT-IMS (Information Management System) website. Sample analysis results will be provided in a Scribe compatible format for samples analyzed at the REAC lab. Outside CLP lab data will only be uploaded into Scribe if the data is received in a Scribe compatible format from the CLP lab.

Quality Assurance Project Plan. Project management, measurement, assessment and usability elements applicable to this WA are included in the corresponding site-specific Quality Assurance Project Plan (QAPP).

Standard Operating Procedures. Standard Operating Procedures (SOPs) and Administrative Procedures (APs) relevant to this WA are included in the site-specific QAPP. REAC personnel will adhere to the following REAC health and safety SOPs for this WA:

SOP #3001, *REAC Health and Safety Program Policy and Implementation*
SOP #3010, *REAC Personal Safety/Protective Equipment*
SOP #3011, *REAC Respiratory Protection Program*
SOP #3012, *REAC Health and Safety Guidelines for Activities at Hazardous Waste Sites*
SOP #3016, *REAC Personal Protective Equipment Program*
SOP #3020, *REAC Inclement Weather, Heat Stress and Cold Stress*

Hazards. While working on this WA, REAC personnel may be exposed to a number of occupational and environmental hazards. These will be covered in detail in the site-specific Health and Safety Plan (HASP). The primary chemical hazards anticipated for this project are exposure to SVOCs and metals especially during sampling activities. All REAC personnel will be required to read and sign the HASP prior to working at the site. The field work will begin with an on-site safety meeting, a discussion of logistics, and a site walk through.

STAFFING PLAN AND SCHEDULE

Staffing Plan. The REAC Task Leader (TL) will maintain contact with the WAM to provide information on the technical and financial progress of the project. The communication will commence with the issuance of the WA. Activities will be summarized in appropriate format for inclusion in REAC Monthly Reports.

The WA for this project was received on January 11, 2006. The WP was initiated within 30 days after receiving the WA. The project will be completed by September 30, 2006.

The REAC TL/Quality Control (QC) Coordinator for the project is the primary point of contact with the WAM. The TL is responsible for the development and completion of the WP and QAPP, project team organization, and supervision of all project tasks, including reporting and deliverables. In addition, the TL

is responsible for ensuring field adherence to the WP and QAPP and recording any deviations on a Work Assignment Change Form.

The REAC Quality Assurance Officer (QAO), the Health and Safety Officer, the Analytical Section Leader, and the Operations Section Leader are responsible for auditing and guiding the project team, reviewing and auditing the deliverables and proposing corrective action, if necessary, for conformity to the WP, QAPP, and the HASP.

The following personnel will work on this project:

Personnel	Responsibilities	Level of Responsibility
Senior Hydrogeologist	Project Coordination, Document Review, Well Installation, Sampling	P4
Analytical Chemist	Laboratory Analyses	P4, P3, P2
Geologist	Well Installation, Sampling	P3
Engineer	Treatment Technologies	P3, P2
Technician (2)	Sampling, GPS Support	T3
Data Base Manager	GIS, ACAD Support	P2
Quality Assurance Officer	WP and QAPP Review	P4
Statistician	Sampling Design	P3

Additional REAC technical and/or administrative personnel may work on this project as needed.

Schedule of Activities and Deliverables.

The schedule of activities and deliverables is as follows:

Activity	Date
Literature Review	January 12 through February 28, 2005
WP	February 10, 2006
QAPP	Two weeks following site reconnaissance
Site Reconnaissance	To be scheduled
Sampling Plan Development	Two weeks following site reconnaissance
Soil Sampling	March 2006
Install Monitor Wells	March 2006
Groundwater and Surface Water Sampling	April 2006
Domestic Well Survey	April 2006
Final Analytical Reports	May 2006
Evaluate Remedial Technologies	May-June 2006
Interim Report	June 30, 2006
Post Deliverables/Data to ERT/IMS Website	As completed

All project deliverable dates are estimated based on the information available at the time of the WP completion. New information, additional tasks, changes in scope, and events outside REAC control may result in revisions to these dates.

Training and Conference/Meeting/Seminar Attendance. In the course of performing the above tasks, REAC personnel may also attend other training offered by the EPA such as safety training, training for procedural changes made by the EPA, or training offered by additional vendors of specific equipment or instrumentation. Specific training will be authorized in advance by the Project Officer (PO) and approved by the Contracting Officer (CO). Attendance at a technical conference, meeting or seminar to perform or support WA activities will be authorized by the PO and approved by the CO. For the ERT to successfully fulfill their mission to share and disseminate scientific information, REAC geologists will provide technical support to prepare and present as necessary technical papers or posters at scientific meetings or conferences.

LEVEL OF EFFORT AND COST PROJECTIONS

The estimated costs (including labor, travel, and materials) to complete this project are given in the attached cost summary sheet. Computer graphics and support, statistical support, and report preparation will be required in order to accomplish WA objectives. Labor hours have been included in the cost estimate for these activities.

Vendor Services. Drilling services in the amount of $30,000 and outside laboratory costs for wet chemistry parameters, such as cyanide and fluoride, in the amount of $3,000 are anticipated for this project if a CLP lab cannot perform the wet chemistry analyses.

Travel Assumptions. Travel assumptions are as follows:

Number of trips from Edison, NJ to Knoxville, TN	4
Number of days per trip:	Trip 1: 2 days, Trip 2: 5 days Trip 3: 10 days Trip 4: 5 days
Number of personnel:	Trip 1: 1 person (with WAM) Trip 2: 3 Trip 3: 2 Trip 4: 2